DOE/EIS-0161 - Final Programmatic Environmental Impact Statement (PEIS) for Tritium Supply and Recycling, October 1995

1. General Scope/Purpose and Need of the EA/EIS

The Department of Energy (DOE) proposes to provide tritium supply and recycling facilities for the Nation's Nuclear Weapons Complex (Complex). Tritium, a man-made radioactive isotope of hydrogen, is an essential component of every warhead in the current and projected U.S. nuclear weapons stockpile. These warheads depend on tritium to perform as designed. Tritium decays at 5.5 percent per year and must be replaced periodically as long as the Nation relies on a nuclear deterrent. The Complex does not have the capability to produce the required amounts of tritium. Projections require that new tritium be available by approximately 2011. The Tritium Supply and Recycling Programmatic Environmental Impact Statement (PEIS) evaluates the siting, construction, and operation of tritium supply technology alternatives and recycling facilities at each of five candidate sites: the Idaho National Engineering and Environmental Laboratory (INEEL), Nevada Test Site (NTS), Oak Ridge Reservation (ORR), the Pantex Plant, and the Savannah River Site (SRS).

2. Alternatives Analyzed

No Action Alternative. Under No Action, DOE would not establish a new tritium supply capability, the current inventory of tritium would decay, and DOE would not meet stockpile requirements of tritium. This would be contrary to DOE's mission as specified by the Atomic Energy Act of 1954, as amended. Sites would continue waste management programs to meet the legal requirements and commitments in formal agreements and would proceed with cleanup activities. Production facilities and support roles at specific sites, however, would be downsized or eliminated in accordance with the reduced workload projected for the year 2010 and beyond. The current DOE missions assumed to continue under No Action are listed for each candidate site.

Technologies Evaluated. Four new tritium supply technologies are being considered in this PEIS: Heavy Water Reactor (HWR), Modular High-Temperature Gas-Cooled Reactor (MHTGR), Advanced Light Water Reactor (ALWR), and the Accelerator Production of Tritium (APT). Each of these would be either collocated with a new tritium recycling facility or use upgraded recycling facilities at SRS. The PEIS also considers purchase of a commercial reactor and conversion to defense purposes or use of a commercial reactor for irradiation services. These commercial reactor alternatives would use upgraded recycling facilities and new extraction and target fabrication facilities at SRS. These tritium supply technologies and recycling facilities and their construction, operation, and waste generation data are discussed in the following sections.

Locations Evaluated. Five locations (INEEL, NTS, ORR, Pantex, and SRS) were considered as candidate sites for the tritium supply and recycling facilities. All of these sites, with the exception of INEEL, were currently performing defense program activities. For the commercial light water reactor alternatives, no specific site was identified. Therefore, any one of the existing operating commercial reactors or partially completed reactors was a potential candidate site for the tritium supply mission. At the time of analysis, 109 commercial nuclear power plants were located at 71 sites in 32 of the contiguous states.

3. Decisions to be Made

The decisions that were identified were the following:

Whether to build new tritium supply and new or upgraded tritium recycling facilities;

Where to locate new tritium supply and recycling facilities; and

Which technologies to employ for tritium supply?

The analysis was not intended to include decisions regarding clean-up or waste management at phased-out facilities; the ultimate disposition of these facilities; or the long-term storage, treatment, and ultimate disposal of some wastes and spent fuel. These activities were to be covered by separate NEPA documents. However, the PEIS does address the waste management implications of the alternatives considered to the extent needed to support programmatic decisions regarding the sites and technologies analyzed.

4. INEEL Programs Analyzed

The INEEL analysis included an overall site description and detailed descriptions of nine distinct and geographically separate functional mission areas. The analysis was grouped into the following two major categories, environmental management activities and other DOE activities.

Environmental management activities that were described include ongoing activities at the following facilities: Waste Engineering Development Facility, Waste Experimental Reduction Facility, Mixed Waste Storage Facility, Idaho Chemical Processing Plant, Radioactive Waste Management Complex, Power Burst Area, Test Area North, Auxiliary Reactor Area, Argonne National Laboratory West, Test Reactor Area, Naval Reactors Facility, and Central Facilities Area.

Other activities that were analyzed include research and development activities on reactor performance at TAN, materials testing and environmental monitoring activities conducted in the Auxiliary Reactor Area, breeder reactor development, the Waste Isolation Pilot Plant (WIPP) test program support at the ANL-W, and ATR operations at the TRA. Included in the ATR analysis is irradiation testing of reactor fuels and material properties; instrumentation for naval reactors; and production of radioisotopes in support of nuclear medicine, industrial applications, research, and product sterilization.

The NRF analysis included the submarine prototypes and the expended core facility. This included the testing of advanced design equipment and new systems for current naval nuclear power propulsion plants and obtaining data for future design. Additionally, facility usage included a comprehensive nuclear plant operational training program for naval personnel.

Non-DOE activities analyzed include research being conducted by the National Oceanic and Atmospheric Administration, the U.S. Geological Survey (USGS), and various institutions of higher learning.

5. Decisions Regarding INEEL Programs

The Record of Decision was issued in December 1995. The decisions that were made did not select any INEEL programs.

DOE/EIS-0200-F - Final Waste Management Programmatic Environmental Impact Statement For Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste, May 1997

1. General Scope/Purpose and Need of EA/EIS

This EIS provides complex-wide analysis of waste management treatment, storage, and disposal options for the following waste types: LLW, HW, TRU, MLLW, HLW. Included are preliminary estimates of the types and amounts of wastes that will be transferred to the WM program from the Environmental Restoration program.

This analysis looks at 54 sites across the complex of which 17 were designated to be major sites. The major sites were selected because they meet one of the following criteria: 1) they are candidates to receive wastes generated offsite, 2) they are candidates to host disposal facilities, 3) they manage HLW, or 4) they were included to be consistent with the Federal Facility Compliance Act (FFC Act) process.

The EIS emphasizes that the analysis was completed for the selection of sites at which to locate WM TSD facilities and not to provide comprehensive NEPA coverage for any specific site. From that standpoint, the analysis that was completed for the WM PEIS may not eliminate the need for additional analysis at a site-wide or project specific level.

Waste types not considered:

Non-hazardous and non-radioactive sanitary waste, non-hazardous solid waste, hazardous and low-level process wastewater, and commercial “Greater-Than-Class-C” LLW are not considered in this WM PEIS. Additionally, some wastes within the radioactive waste type categories, such as LLW, TRU, and HLW, have characteristics that require special considerations and different management than most of the other waste within that category. These wastes are “special case wastes” and are managed on a case-by-case basis; they are not specifically evaluated in the WM PEIS, although the waste volumes reported in the PEIS largely account for them.

2. Alternatives Analyzed

A total of 36 alternatives are analyzed for the different waste types. These alternatives reflect different national configurations of particular sites evaluated for each of the different waste types considered. The alternatives are comprised of a combination of site selections to be used for waste storage, treatment, and disposal on a complex-wide basis. The alternatives are grouped according to the following categories:

No Action Alternatives. Selection of this alternative would involve using only currently existing or planned waste management facilities at DOE sites or commercial vendors.

Decentralized Alternatives. Selection of these alternatives would result in managing waste where it is or where it will be generated, treated, or disposed of in the future. Unlike the No Action Alternative, this alternative may require the siting, construction, and operation of new facilities or modification of existing facilities.

Regionalized Alternatives. Selection of these alternatives would result in transporting wastes to various numbers of sites (fewer than the number of sites considered for the Decentralized

Alternatives but greater than the number of sites considered for the Centralized Alternatives). In general, those sites that now have the largest volumes of a given waste type were considered as regional sites for treatment, storage, or disposal.

Centralized Alternatives. Selection of these alternatives would result in transporting wastes to one or two sites for treatment, storage, or disposal. As with the Regionalized Alternatives, those sites that have the largest volumes of a given waste type were considered as sites for Centralized treatment, storage, or disposal.

3. Decisions to be Made

DOE used the analyses presented in the PEIS to decide on a programmatic or strategic approach to managing its waste.

MLLW – Decisions on where to treat and store MLLW were discussed in the document but are primarily made by the states and EPA under the FFC Act. The Final EIS was released after EPA and authorized State agencies issued orders implementing most of the site treatment plans. DOE issued Records of Decision on the treatment and disposal of MLLW, explaining what decisions were made by the States and the EPA and what alternatives were considered.

LLW – Decisions on where to treat, treatment methods, and where to dispose of LLW across the complex were discussed. Storage of LLW will remain where the waste is generated.

TRU – DOE will decide where to treat and store TRU based on evaluations in the WM PEIS and the requirement of the FFC Act because much of DOE's TRU is also mixed waste. DOE needs to decide where to treat TRU if treatment is deemed necessary before disposal at WIPP or some other form of disposition. DOE will also decide where to store treated TRU on the basis of the PEIS, a decision it must make regardless of whether or when WIPP opens.

HLW – DOE needs to decide where to store treated HLW until it can be permanently disposed of in a geologic repository. Treatment has already begun at SRS, West Valley Demonstration Project (WVDP), and Hanford.

HW – DOE will decide whether to continue its reliance on commercial vendors or to treat HW at selected DOE sites.

4. INEEL Programs Analyzed

For each of the waste types discussed above, there is a general description of the various pieces of the program. In addition, a general site overview was given with the environmental impacts of each of the alternatives.

The Cumulative Impacts section addresses INEEL impacts from each of the alternatives that include INEEL operations. Primarily this looks at overall impacts from a resource utilization standpoint and provides radiological exposure estimates.

The Site Data Tables provide waste generation and storage data and is summarized in 17 different tables from which the environmental impacts were taken.

5. Decisions Regarding INEEL Programs

The RODs issued as a result of this are programmatic in nature and site-specific NEPA analysis will still be required to implement specific treatment technologies or the particular location of a waste management facility.

HLW ROD – Maintain HLW in storage. DOE-ID is preparing a HLW EIS which will provide the basis for treatment and storage options.

TRU ROD – Prepare and store TRU waste on site prior to disposal at WIPP. It may be necessary to provide waste treatment for wastes from other sites. The ROD identified the INEEL as one place where complex-wide treatment maybe necessary. The TRU ROD only allows for shipment of these waste streams to the INEEL and does not address treatment methods or options.

LLW/MLLW ROD – The DOE has decided to perform minimum treatment at all sites and continue, to the extent practicable, disposal of onsite LLW at the INEEL. In addition the Department has decided to make the Hanford Site in Washington and the Nevada Test Site available to all DOE sites for LLW disposal. INEEL will continue to dispose of LLW generated by the Naval Nuclear Propulsion Program. For the management of mixed low-level waste analyzed in the WM PEIS, the Department has decided to treat MLLW at the INEEL (among other sites) and to dispose of MLLW at the Hanford Site and the NTS.

HAZ (Hazardous waste) ROD – The DOE decided to continue to use off-site commercial facilities for the treatment and disposal of major portions of the non-wastewater hazardous waste generated at DOE sites. The decision does not involve any transfers of non-wastewater hazardous waste among DOE sites. The decision for the INEEL was that all non-wastewater hazardous waste would continue to be treated and disposed at off-site commercial facilities.

DOE/EIS-0203F - DOE Programmatic Spent Nuclear Fuel Management and INEL Environmental Restoration and Waste Management Programs Final Environmental Impact Statement, Vols. 1 and 2, April 1995

1. General Scope/Purpose and Need of EA/EIS

The DOE's proposed action for Volume 1 is to safely, efficiently, and responsibly manage existing and projected quantities of DOE's SNF through the year 2035, pending ultimate disposition. Volume 1 was developed to support DOE's decision making on the most appropriate location for implementing national strategies for managing DOE's SNF until its ultimate disposition is determined and implemented. For planning purposes, it has been assumed that decisions regarding ultimate disposition strategies may require as long as 40 years to implement. The general environmental consequences of managing SNF in a range of configurations at various sites are summarized in this volume. This analysis includes options for storage, stabilization, and transportation of SNF.

For the purposes of the EIS, SNF was separated into two categories: commercial SNF and DOE- managed SNF. The management of commercial SNF (with a few special-case exceptions) is outside the scope of the 1995 EIS and was not discussed further.
The EIS analyzed SNF that is held at three major storage sites: Hanford, INEL, and SRS. In addition SNF held at a number of other sites was identified for disposition. Other sources of SNF that were analyzed include the Naval Nuclear Propulsion Program, Foreign Research Reactor SNF, non-DOE domestic research and test reactors SNF, and special-case commercial SNF at non-DOE locations.

Volume 2 addresses the Environmental Restoration and Waste Management Programs at the INEEL. The DOE objectives for the 10 years analyzed were to mitigate the impacts of past operations through environmental restoration and to treat, store, or dispose of waste at the INEEL in a way that minimizes future adverse impacts.

This section discusses the scope of the EIS as it relates to INEEL's ER&WM and spent nuclear fuel activities and the timeframe for decisions supported by this EIS. Activities addressed in the EIS primarily include those that have produced and continue to produce radioactive (high-level, transuranic, low-level, and mixed) wastes, hazardous waste, and INEEL industrial waste. Activities that fall outside the scope of the EIS are also identified. This EIS provides the analysis required under the National Environmental Policy Act for certain projects required to implement the Spent Nuclear Fuel and ER&WM Programs at the INEEL.

2. Alternatives Analyzed

<u>Summary of Alternatives for the Management of DOE Spent Nuclear Fuel</u>

No Action. Take minimum actions required for safe and secure management of SNF at or close to the generation site or current storage location.

Decentralization. Store most SNF at or close to the generation site or current storage location, with limited shipments to DOE facilities.

1992/1993 Planning Basis. Transport and store newly generated SNF at the INEEL or Savannah River Site. Consolidate some existing fuels at the INEEL or at the Savannah River Site.

Regionalization. Distribute existing and projected SNF among DOE sites based primarily on fuel type (Regionalization 4A) or geographic location (Regionalization 4B).

Centralization. Manage all existing and projected SNF inventories at one site until ultimate disposition.

Summary of Alternatives for the Management of the INEEL SNF, ER, and WM Programs

No Action. Complete all near-term actions identified and continue operating most existing facilities. Serves as benchmark for comparing potential effects from the other three alternatives.

Ten-Year Plan. Complete identified projects and initiate new projects to enhance cleanup, manage the INEEL waste streams and spent- nuclear fuel, prepare waste for final disposal, and develop technologies for spent nuclear fuel ultimate disposition.

Minimum Treatment, Storage, and Disposal. Minimize treatment, storage, and disposal activities at the INEEL to the extent possible (including receipt of spent nuclear fuel). Conduct minimum cleanup and decontamination and decommissioning prescribed by regulation. Transfer spent nuclear fuel and waste from environmental restoration activities to another site.

Maximum Treatment, Storage, and Disposal. Maximize treatment, storage, and disposal functions at the INEEL to accommodate waste and spent nuclear fuel from DOE facilities. Conduct maximum cleanup and decontamination and decommissioning.

Preferred Alternative. Complete activities as in Alternative B (ten-year Plan), plus accept offsite transuranic and mixed low-level waste for treatment and return treated waste to the source generator of to approved disposal facilities. Plan for a high-level waste treatment facility that minimizes resulting high-activity waste. Transfer aluminum-clad spent nuclear fuel to Savannah River Site.

3. Decisions to be Made

DOE faces a number of major programmatic and site-specific decisions regarding SNF management over the next 40 years, including:

Where should DOE locate specific SNF management activities?

> Broadly, the alternatives include managing the SNF where it is and minimizing shipments; consolidating the SNF at a limited number of sites (the Decentralization, 1992/1993 Planning Basis, and Regionalization 4A and 4B alternatives); or consolidating the SNF at a central site.

What capabilities, facilities, and technologies are needed for SNF management?

> DOE has identified the need for SNF interim storage sites and must select appropriate means at each site for meeting these needs under each of the SNF siting alternatives.

What research and development activities should support the SNF management program?

INEEL Decisions to be Made Based on this EIS

Spent Nuclear Fuel: What is the appropriate strategy of the INEEL to implement DOE's national spent nuclear fuel decisions regarding transportation, receipt, processing, and storage of spent nuclear fuel?

What is the appropriate storage capacity for spent nuclear fuel?

Environmental Restoration and Waste Management: What is the appropriate strategy of the INEEL to implement DOE'S national environmental restoration and waste management decisions?

What are the appropriate cleanup activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, and the Federal Facility Agreement and Consent Order of 1991?

What are the necessary capabilities, facilities, research and development, and technologies for treating, storing, and disposing of each waste type?

What treatment technologies should be used for sodium-bearing and high-level wastes and other radioactive and mixed waste?

4. INEEL Programs Analyzed

Broadly, the INEEL programs analyzed include the SNF, ER, WM, Infrastructure, ANL-W, and NRF programs. Also included was technology development activities needed to implement the programs.

5. Decisions Regarding INEEL Programs

The decision made was a modification of the Ten-Year Plan which includes additional features drawn from the Minimum and Maximum treatment, storage and disposal alternatives. Ongoing spent fuel management, environmental restoration and waste management activities and projects would continue and be enhanced to meet current and expanded spent fuel and waste handling needs. These enhanced activities would be needed to comply with regulations and agreements and would result from acceptance of specific additional off site-generated materials and waste.

DOE/EIS – 0218F - Final Environmental Impact Statement for the Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel, February 1996

1. General Scope/Purpose and Need of EIS/EA

This Environmental Impact Statement (EIS), prepared by DOE's Office of Environmental Management (EM) and the Department of State, meets a commitment made by DOE to prepare an environmental review of the impacts of extending a program for accepting foreign research reactor (FRR) spent nuclear fuel (SNF).

Since the 1950s, as part of the "Atoms for Peace" program, the US has provided peaceful nuclear technology to foreign nations in exchange for their promise to forego development of nuclear weapons. A major element of this program was the provision of research reactor technology and the Highly Enriched Uranium (HEU) necessary to fuel the reactors. In 1978, the US initiated the Reduced Enrichment for Research and Test Reactors program to reduce the use of HEU in civilian programs by promoting the conversion of FRRs from HEU fuel to low-enriched fuel (LEU).

Since 1958, the US has accepted the return of the fuel as SNF to ensure US control of the complete cycle of fuel management, especially HEU. This return program for SNF ended in 1988 for HEU and 1992 for LEU.

2. Alternatives Analyzed

The proposed action is for DOE and the Department of State to jointly adopt a policy to manage SNF from FRR. Only SNF containing uranium enriched in the US would be covered by the proposed action. The purpose of the proposed policy is to promote US nuclear weapons nonproliferation policy objectives, specifically by seeking to reduce, and eventually eliminate, HEU from civilian commerce. The proposed policy applies solely to aluminum-based and TRIGA FRR SNF and target material containing HEU and LEU of US origin.

To implement the proposed action, the EIS analyzed three "Management Alternatives," which are:

<u>Management Alternative 1</u>: Accept and manage FRR SNF in the US. This could be implemented by accepting FRR SNF (containing HEU or LEU enriched in the US) for management in the US.

FRR SNF containing uranium enriched in the US would be transported to the US in casks designed on the basis of international regulations that are essentially identical to those promulgated by the NRC and certified by the US Department of Transportation. In accordance with the Record of Decision for the 1995 EIS, all of the aluminum clad FRR SNF accepted by DOE would be managed at the Savannah River Site in South Carolina, and any other FRR SNF, such as the TRIGA elements, to be accepted by DOE would be managed at the INEEL, pending ultimate disposition. All five of the SNF management sites originally considered were analyzed in this EIS to maintain maximum consistency with the analyses provided in the 1995 EIS.

Management Alternative 2: Facilitate the management of FRR SNF overseas. This could be implemented by US assistance in SNF storage or reprocessing.

Under this Management Alternative, DOE and the Department of State would seek to facilitate the management of FRR SNF overseas in a manner that would be consistent with US nuclear weapons nonproliferation policy. DOE and the Department of State have evaluated two sub-alternatives: Overseas Storage and Overseas Reprocessing.

a. Overseas Storage

The US would assist FRRs that are able to store their SNF in facilities in their own countries as a step toward final disposition. US assistance would be provided to ensure that appropriate storage technologies, regulations and safeguards were applied.

b. Overseas Reprocessing

The US would facilitate and provide non-technical (financial and/or logistical) assistance to FRRs and reprocessors to facilitate reprocessing of SNF fuel overseas in facilities operated under international safeguards consistent with US nuclear weapons nonproliferation concerns.

The overseas reprocessing option was evaluated in light of the US nuclear weapons nonproliferation policy on HEU minimization. In this analysis, factors such as the following were considered:

A commitment that HEU separated during reprocessing would be blended down to LEU for research reactors, which are converting to LEU.
The foreign reprocessors would provide the capability to reprocess LEU as well as HEU.
Research reactors would be encouraged to convert to LEU if a LEU fuel exists or is developed that will allow such operation.

Arrangements would have to be worked out with foreign reprocessors that would be consistent with US nuclear weapons nonproliferation objectives to minimize the civil use of HEU worldwide.

Management Alternative 3: A hybrid, or combination of elements from the above two Management Alternatives.

In implementing the proposed action, DOE and the Department of State could combine implementation elements from Management Alternatives 1 and 2, such as partial storage or reprocessing overseas with partial storage or chemical separation in the US.

To demonstrate the kind of hybrid alternatives that could be developed, this EIS considers the following hybrid alternative example: DOE and the Department of State would facilitate the reprocessing of FRR SNF at Western European reprocessing facilities (e.g., Dounreay or Marcoule) for research reactors in countries that could accept the waste from reprocessing, and DOE would accept and manage in the US the rest of the FRR SNF from countries that could not accept the waste from reprocessing. Of the FRR SNF to be accepted in the US, the aluminum-based portion would be chemically separated at the Savannah River Site and the TRIGA portion would be stored in existing facilities at the INEEL.

The impacts to the US environment from hybrid alternatives would be covered by the analyses presented in the EIS for Management Alternative 1, because the analyses for Management Alternative 1 consider the maximum amount of FRR SNF that could be accepted, stored, and/or chemically separated in the US.

Management Alternative 4: No action alternative.

In the No Action Alternative, the US would neither manage FRR SNF containing uranium enriched in the US, nor provide technical assistance or financial incentives for overseas storage or reprocessing. In this case, there would be no FRR SNF shipments to the US and no assistance to foreign countries for managing FRR SNF overseas.

Preferred Alternative: In its Final EIS, DOE announced the preferred alternative as Management Alternative 1 (Manage Foreign Research Reactor Spent Nuclear Fuel in the United States), with certain modifications.

The components for basic implementation of Management Alternative 1 provide the foundation for the analyses of impacts presented in the EIS. They are:

Policy Duration;
Financing Arrangement;
Amount of Foreign Research Reactor Spent Nuclear Fuel;
Location for Taking Title to Foreign Research Reactor Spent Nuclear Fuel;
Marine Transport;
Port(s) of Entry;
Ground Transport;
Foreign Research Reactor Spent Nuclear Fuel Management Sites; and
Storage Technologies.

For receipt and management of FRR SNF within the US, the EIS analyzed impacts at the following 10 candidate ports of entry:

Charleston, SC (includes Naval Weapons Station and Wando Terminal, Mt. Pleasant);
Galveston, TX;
Hampton Roads, VA (includes Terminals at Newport News, Norfolk, and Portsmouth, VA);
Jacksonville, FL;
Military Ocean Terminal Sunny Point, NC;
Naval Weapons Station Concord, CA;
Portland, OR;
Savannah, GA;
Tacoma, WA; and
Wilmington, NC.

For receipt and management of FRR SNF within the US, the EIS analyzed (as in the Programmatic SNF&INEL Final EIS before it) five management sites:

Savannah River Site;
Idaho National Environmental and Engineering Laboratory;
Oak Ridge Reservation;
Hanford Site; and

Nevada Test Site.

For the purpose of site impact analyses, the implementation of the policy was divided into two functional periods: the period during which receipt and management of FRR SNF would be accomplished by using existing facilities (Phase 1); and the period during which new or refurbished facilities could be used (Phase 2).

3. Decisions to be Made

The principal policy decision for which this EIS will provide a basis is: whether the US should adopt a policy for the management of FRR SNF containing uranium enriched in the US.

A decision to manage FRR SNF in the US would require decisions to be made on: the duration of the policy, amount of fuel to be accepted, transportation modes, ports of entry, and method of spent nuclear fuel management (storage, chemical separation, or use of a new treatment and/or packaging technology).

A decision to facilitate management of FRR SNF overseas, would require decisions to be made on what assistance the US would provide to foreign nations for storage or reprocessing of the spent nuclear fuel overseas.

4. INEEL Programs Analyzed

Implementation of Management Alternative 1, would impact the INEEL as follows:

As a potential Phase 1 storage site under Management Alternative 1, the INEEL would receive and manage FRR SNF at existing dry and/or wet storage facilities. The existing facilities identified for this purpose would be the Fluorinel Dissolution and Fuel Storage Facility in CPP-666, the Irradiated Fuel Storage Facility in CPP-603, and the CPP-749 storage area.

As a potential Phase 2 storage site, the INEEL could continue to receive and manage FRR SNF at a new dry storage or wet storage facility to be constructed at the site.

5. Decisions Regarding INEEL Programs

On May 13, 1996, DOE released its RECORD OF DECISION for the FINAL ENVIRONMENTAL IMPACT STATEMENT on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel.

The decision reads, in part: DOE, in consultation with the Department of State, has decided to implement a new foreign research reactor spent fuel acceptance policy as specified in the Preferred Alternative contained in the Final EIS (the Final EIS, DOE/EIS-218F of February 1996), subject to additional stipulations specified in Section VII of this Record of Decision. The new policy applies only to aluminum-based and TRIGA FRR SNF and target material containing uranium enriched in the US. The purpose of the acceptance policy is to support the broad United States' nuclear weapons nonproliferation policy calling for the reduction and eventual elimination of the use of highly enriched (weapons-grade) uranium in civil commerce worldwide.

Over the life of the foreign research reactor SNF acceptance program, DOE could accept approximately 19.2 metric tons of heavy metal (MTHM) of foreign research reactor SNF in as many as 22,700 separate elements and approximately 0.6 MTHM of target material. Most of the fuel will arrive through the Charleston Naval Weapons Station in South Carolina (about 80 percent), with a very limited amount arriving through the Concord Naval Weapons Station in California (about 5 percent). Most of the target material and some of the fuel (about 15 percent) will arrive overland from Canada. Shipments through Charleston began in September 1996 and those through Concord began in July 1998.

After a limited period of storage, DOE will process and package the fuel as necessary at the SRS and the Idaho National Engineering and Environmental Laboratory to prepare it for disposal in a geologic repository.

DOE/EIS-0229 - Storage and Disposition of Weapons--Usable Fissile Materials - Final Programmatic Environmental Impact Statement, November 1996

1. General Scope/Purpose and Need for EA/EIS

The purpose of this action is to implement the President's *Nonproliferation and Export Control Policy* in a safe, reliable, cost-effective, and timely manner.

Disposition of surplus plutonium is needed to reduce reliance on institutional controls and to provide visible evidence of irreversible disarmament. DOE recognizes the need to strengthen national and international arms control efforts by providing a storage and disposition model for the international community.

2. Alternatives Analyzed

A total of nine alternatives with numerous variants were analyzed for eight candidate DOE sites.

Long-term Storage Alternatives and Related Activities. The "Long-term Storage Alternatives and Related Activities" alternatives are grouped as follows:

(1) No Action Alternative
(2) Preferred Alternative
(3) Upgrade at Multiple Sites
(4) Consolidation of Plutonium

Plutonium Disposition Alternatives and Related Activities. The "Plutonium Disposition Alternatives and Related Activities" alternatives are grouped as follows:

(1) No Disposition Action
(2) Preferred Alternative
(3) Deep Borehole Category
  (A) Direct Disposition
  (B) Immobilized Disposition

(4) Immobilization Category
  (A) Vitrification
  (B) Ceramic Immobilization
  (C) Electrometallurgical Treatment

(5) Reactor Category
  (A) Existing Light Water Reactor
  (B) Partially Completed Light Water Reactor
  (C) Evolutionary Light Water Reactor
  (D) Canadian Deuterium Uranium Reactor

3. Decisions to be Made

The decisions to be made by the DOE in this EIS were:

(1) For Storage

(A) The strategy for long-term storage of non-surplus, weapons-usable plutonium and non-surplus Highly Enriched Uranium (HEU)

(B) The strategy for storage of surplus plutonium and surplus HEU pending disposition

(C) The storage site(s) and (if appropriate) facilities

(2) For Disposition

(A) The strategy and technologies for disposition of surplus, weapons-usable plutonium

4. INEEL Programs Analyzed

Concerning HEU storage, the INEEL is identified as a potential site for the "No Action Alternative" (i.e., Maintain Existing HEU Storage).

Concerning plutonium disposition, the INEEL is identified as a potential site for the "Pit Disassembly/Conversion" and "MOX Fuel Fabrication" alternatives.

5. Decisions Regarding INEEL Programs

The material at the INEEL will continue to remain in INEEL storage until a permanent disposition is identified.

INEEL may be selected (based on additional analysis) as a location for a MOX fuel fabrication facility and a pit disassembly and conversion facility.

DOE/EIS-0249-F - Medical Isotopes Production Project: Molybdenum 99 and Related Isotopes Environmental Impact Statement, April 1996

1. General Scope/Purpose and Need of EA/EIS

The U.S. Department of Energy (DOE) proposes to establish a domestic source for and to produce molybdenum-99 (Mo-99) and related medical isotopes, including iodine-131, xenon-133, and iodine-125. DOE proposed this project to ensure a reliable supply to the U.S. medical community of the metastable isotope technetium-99 (Tc-99m), which is produced from Mo-99. This Final Environmental Impact Statement (EIS) analyzes the environmental impacts of alternatives to accomplish the proposed action.

2. Alternatives Analyzed

This EIS evaluates the reasonable alternatives that would meet the purpose and need for agency action and identifies alternatives that were considered but eliminated from detailed study, and briefly discusses the reasons for their elimination. In addition, a No Action alternative, as required by the Council on Environmental Quality regulations for compliance with the National Environmental Policy Act (NEPA), is presented as a basis for comparison.

<u>No Action</u>. Under this alternative, DOE would not establish a production source for Mo-99.

<u>Annular Core Research Reactor – Sandia National Laboratory (SNL) and the Los Alamos National Laboratory (LANL) Chemistry and Metallurgy Research (CMR) Facility</u>. Wing 9 of the LANL Chemistry and Metallurgy Research building or a building within an existing facility at SNL/NM would be used to fabricate targets. The operating Annular Core Research Reactor and supporting facilities at SNL/NM would be used to produce Mo-99 and related isotopes. Low-level radioactive wastes would be disposed of at the Nevada Test Site.

<u>Omega West Reactor/Chemistry and Metallurgy Research Facility, LANL</u>. All process steps would be carried out onsite at LANL. Wing 9 of the Chemistry and Metallurgy Research building would be used for fabricating the targets and recovering Mo-99 in the hot cells. The target irradiation would occur in the Omega West Reactor, which would be repaired and restarted for this purpose. Low-level radioactive wastes would be disposed of onsite at LANL.

<u>Oak Ridge Research Reactor/Radioisotope Development Laboratory – Oak Ridge National Laboratory (ORNL)</u>. The Radioisotope Development Laboratory would be customized and dedicated for target fabrication and Mo-99 processing. Mo-99 would be produced by irradiating targets using the Oak Ridge Research Reactor, which would be restarted and designated as the Medical Isotope Production Center. Low-level radioactive wastes would be disposed of at the Nevada Test Site.

Power Burst Facility (PBF) /Test Area North (TAN) - INEEL. All process steps would be carried out onsite at INEL. Targets would be fabricated at INEEL at the TAN in a building similar to the Experimental Test Reactor Critical Facility annex or the lower floor of the Materials Test Reactor building. The targets would be shipped for irradiation to the Power Burst Facility, which would be restarted for this purpose. The Mo-99 would be extracted from the irradiated targets, either in existing hot cells at the Test Area North or at new hot cells constructed for this purpose. Low-level radioactive wastes would be disposed of onsite at INEEL.

3. Decisions to be Made

DOE must decide whether to produce Mo-99 and other medical isotopes or leave this production capability to the private sector or foreign suppliers. In addition, DOE must decide what facilities would be used if the decision is made to provide the capability.

4. INEEL Programs Analyzed

Power Burst Facility/Test Area North. All process steps would be carried out onsite at INEEL. Targets would be fabricated at INEEL at the Test Area North in a building similar to the Experimental Test Reactor Critical Facility annex or the lower floor of the Materials Test Reactor building. The targets would be shipped for irradiation to the Power Burst Facility, which would be restarted for this purpose. The Mo-99 would be extracted from the irradiated targets, either in existing hot cells at the Test Area North or at new hot cells constructed for this purpose. Low-level radioactive wastes would be disposed of onsite at INEEL.

The ATR was also considered for Mo-99 production but was eliminated as a candidate site.

5. Decisions Regarding INEEL Programs

No INEEL programs were selected for the proposed action.

The preferred alternative was selected. This included target fabrication at the Chemistry and Metallurgy Research (CMR) at LANL, target irradiation at the Annular Core Research Reactor (ACRR) at Sandia, and the hot cell adjacent to the ACRR for isotope extraction. Any of the other medical isotopes that were discussed in the analysis (Xe-133, I-125, I-131) can be produced at any of the alternative production sites that were considered in the analysis. I-131 and Xe-133 are basically byproducts of Mo-99 production. I-125 can be produced by irradiating Xe-124.

DOE/EIS-0250D - Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, July 1999

1. General Scope/Purpose and Need of the EA/EIS

In 1982, Congress enacted the Nuclear Waste Policy Act (NWPA) which acknowledged the Federal Government's responsibility to provide permanent disposal of the nation's spent nuclear fuel and high-level radioactive waste, and established the Office of Civilian Radioactive Waste Management. The NWPA began a process for selecting sites for technical study as potential geologic repository locations. DOE identified nine candidate sites; the Secretary of Energy nominated five of the nine sites for further consideration and President Reagan approved three as candidates. In 1987, Congress significantly amended the NWPA. The amended NWPA identified one of the three presidentially approved candidate sites, Yucca Mountain (YM), as the only site to be studied as a potential location for a geologic repository. Congress directed the Secretary of Energy to study the Yucca Mountain site and recommend whether the President should approve the site for development as a repository. Congress also required that a Final EIS accompany a secretarial recommendation to approve the Yucca Mountain site to the President. The YM EIS is that EIS.

2. Alternatives Analyzed

The YM EIS analyzes a Proposed Action to construct, operate and monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high level radioactive waste at YM. The EIS also analyzes a No-Action Alternative, under which DOE would not build a repository at the YM site, and spent nuclear fuel and high-level radioactive waste would remain at 72 commercial and 5 DOE sites across the U.S. As part of the Proposed Action, the EIS analyzes the potential impacts of transporting spent nuclear fuel and high-level radioactive waste to the YM site from 77 sites across the U.S. This analysis includes information on such matters at the comparative impacts of truck and rail transportation, alternative intermodal (rail to truck) transfer station locations, associated heavy-haul truck routes, and alternative rail transport corridors in Nevada. Although it is uncertain at this time when DOE will make any transportation-related decisions, DOE believes that the EIS provides the information necessary to make decisions regarding the basic approaches as well as the choice among alternative transportation corridors. Follow-on implementing decisions, such as selection of a specific rail alignment within a corridor, or the specific location of an intermodal transfer station or the need to upgrade the associated heavy-haul routes, would require additional field surveys, state and local government consultations, environmental and engineering analyses, and NEPA reviews.

3. Decisions to be Made

If the Secretary of Energy recommends the YM Site to the President, a comprehensive statement of the basis for the recommendation, including the Final EIS, will accompany the recommendation. The Draft EIS has been prepared so that DOE can consider the Final EIS, including the public input on the Draft EIS, in making a decision on whether to recommend the site to the President. If after the recommendation by the Secretary, the President considers the site qualified for an application to the Nuclear Regulatory Commission for a construction authorization, the President will submit a recommendation of the site to Congress. The Governor or legislature of Nevada may object to the site by submitting a notice of disapproval to Congress within 60 days of the Presidents action. If the Governor of legislature of Nevada do not object, site designation would become effective without further action by the President or Congress. If the Governor or legislature does object, the site would be disapproved unless Congress passed a joint resolution of repository siting approval and the President signed it into law. If the YM Site designation became effective the Secretary of Energy would submit to the Nuclear Regulatory Commission a License Application, based on a particular facility design, for construction and authorization no later than 90 days after the designation.

4. INEEL Programs Analyzed

The Draft YM EIS considers a repository inventory of 70,000 MTHM comprised of 63,000 MTHM of commercial spent nuclear fuel and 7,000 MTHM of DOE spent nuclear fuel and high-level radioactive waste. This overall inventory includes approximately 50 metric tons of surplus weapons-usable plutonium as spent mixed-oxide fuel and immobilized plutonium.

The decision on the YM EIS will directly effect the INEEL spent nuclear fuel and high-level waste programs. If the site is not designated, it is unknown if or when another site would be designated or if or when technology, such as transmutation, would be developed to treat the wastes for placement in other than a national geologic repository. If no site were designated, the INEEL would have to provide for the long-term storage of spent nuclear fuel and high-level waste.

5. Decisions Regarding INEEL Programs

The YM EIS accounts for the inventory of INEEL spent nuclear fuel and high-level waste but does not place these in any priority or order for shipment off the INEEL to the YM site.

DOE/EIS-0251 - Department of the Navy Final Environmental Impact Statement for a Container System for the Management of Naval Spent Nuclear Fuel, November 1996

1. General Scope/ Purpose and Need of EA/EIS

The Department of the Navy published the Final Environmental Impact Statement in November 1996. This EIS analyzed environmental impacts at the Naval Reactors Facility and other parts of the INEEL that might result from alternatives for loading, storing, and shipping naval spent nuclear fuel. Among other parts of the alternatives, it evaluated impacts from manufacturing container systems, loading, storage, and shipping operations at INEEL facilities, alternative locations for naval fuel storage at INEEL, and transportation of naval SNF to a repository.

The first ROD resulting from this EIS, published in January 1997 (62 FR 1095), documented a decision by the Navy and the DOE, as a cooperating agency, to select a dual-purpose canister system for the loading, storage, transport, and possible disposal of naval SNF. A second ROD was published in April 1997, announcing the selection of the Naval Reactors Facility as the location for naval spent nuclear fuel loading and dry storage facilities. This EIS and the associated RODs completed all NEPA analyses needed to support actions related to naval spent nuclear fuel required under Section F.4 of the Settlement Agreement with the state of Idaho.

2. Alternatives Analyzed

The Container System EIS considered six alternative dry storage container systems for the loading, storage, transport, and possible disposal of post-examination naval spent nuclear fuel and the management of special case waste (i.e., low-level radioactive waste that contains concentrations of certain short- and long-lived isotopes which requires disposal by more stringent measures than land burial). The alternatives included the use of either existing dry storage containers or dry storage containers that could be produced by manufacturers of such equipment.

Because of differences in configurations among naval spent nuclear fuel assemblies, all alternatives required containers to have internal baskets designed for specific naval spent nuclear fuel types. A brief description of the six alternatives analyzed in the Container System EIS follows:

1) Multi-Purpose Canister Alternative

This alternative uses about 300 large (125-ton) multi-purpose canisters for storage, transportation, and disposal of naval spent nuclear fuel, without repackaging or further handling of individual spent nuclear fuel assemblies.

2) No Action Alternative

Use of existing technology to handle, store, and subsequently transport naval spent nuclear fuel to a geologic repository or a centralized interim storage site using the Navy M-140 transportation cask.

3) Current Technology/Rail Alternative (Current Technology Supplemented by High Capacity Rail Casks)

This alternative uses the same storage methods and M-140 transportation cask described in the no-action alternative, but with redesigned internal structures for the M-140 cask to accommodate a larger amount of naval spent nuclear fuel per cask, thus reducing the total number of shipments required.

4) Transportable Storage Cask Alternative

This alternative uses an existing, commercially available transportable storage cask for storage at the INEEL as well as for transportation to a repository or centralized interim storage site.

5) Dual-Purpose Canister Alternative

This alternative uses an existing, commercially available canister and overpack system for storage at the INEEL and shipment of naval spent nuclear fuel to a geologic repository or centralized interim storage site.

6) Small Multi-Purpose Canister Alternative

This alternative uses about 500 smaller (75-ton) multi-purpose canisters, rather than large multi-purpose canisters.

3. Decisions to be Made

DOE must select a container system for the management of naval SNF that would also provide for management of special case low-level radioactive waste.

4. INEEL Programs Analyzed

Analyzes environmental impacts at the INEEL and the location(s) for fabrication of container systems in the following areas:

Manufacturing alternative container systems
Loading and storage at INEEL facilities
Unloading naval SNF at a repository surface facility or a centralized interim storage facility
Impacts of transportation of naval SNF

5. Decisions Regarding INEEL Programs

In December of 1996, the Department of the Navy released its *Record of Decision, Container System for the Management of Naval Spent Nuclear Fuel*, U.S. Department of the Navy, Federal Register Notice, p. 1095, January 8, 1997 (62 FR 1095). The decision is as follows.

DECISIONS: The Navy announces its decision to use a dual-purpose canister system for the management of post-examination naval SNF and special case low-level radioactive waste. The primary benefits of a dual-purpose canister system are efficiencies in container manufacturing and fuel reloading operations and potential further reduction in radiation exposure.

This decision does not constitute final action for location(s) for dry loading naval SNF which is currently stored at the INTEC or which will be stored at the INTEC prior to establishment of a dry storage facility, or for locations(s) for temporary dry storage of naval SNF at the INEEL. Those actions will be the subject of an upcoming ROD.

In April of 1997, the Department of the Navy released its *Second Record of Decision for a Dry Storage Container System for the Management of Naval Spent Nuclear Fuel*, U.S. Department of the Navy, Federal Register Notice, p. 23770, May 1, 1997 (62 FR 23770).
The decision is as follows.

DECISIONS: The Navy and DOE have determined the location where naval SNF which is, or which will be, stored at the INTEC will be loaded into dual purpose canisters, and the location where all dual purpose canisters loaded with naval SNF and special case waste will be temporarily stored prior to the naval SNF being shipped to a permanent geologic repository or centralized interim storage facility outside of the State of Idaho when one becomes available. In this second Record of Decision, the Navy and DOE announce the decision to load the naval SNF which is, or which will be, stored at the INTEC, into dual-purpose canisters at the Naval Reactors Facility (NRF). Both the INTEC and the NRF are located on the INEEL in southeastern Idaho. The Navy and DOE also announce the additional decision that all dual purpose canisters loaded with naval SNF and special case waste will be stored at a developed area on the INEEL site to the east of the Expended Core Facility (ECF) at the NRF.

DOE/EIS – 0279 - Savannah River Site Spent Nuclear Fuel Management Final Environmental Impact Statement, March 2000

1. General Scope/Purpose and Need of EIS/EA

This Environmental Impact Statement (EIS) responds to the need for DOE to safely and effectively manage spent nuclear fuel (SNF) and targets at the Savannah River Site (SRS) in Aiken County, South Carolina, including placing these materials in forms suitable for ultimate disposition. Options to treat, package, and store this material are discussed.

DOE anticipates placing most of its aluminum-based SNF inventory in a geologic repository after treatment or repackaging. However, DOE does not expect any geologic repository to be available until at least 2010 and shipments from DOE sites would not begin until about 2015. Until a repository is available, the Department intends to develop and implement a safe and efficient SNF management strategy that includes preparing aluminum-based SNF stored at SRS or expected to be shipped to SRS for disposition offsite. DOE is committed to avoiding indefinite storage at the SRS of this SNF in a form that is unsuitable for final disposition. Therefore, DOE needs to identify management technologies and facilities for storing and treating this SNF in preparation for final disposition.

The materials addressed in this EIS consist of approximately 68 metric tons heavy metal (MTHM) of SNF. This SNF can be described as having three general points of origin:

- 20 MTHM of aluminum-based SNF at SRS;
- as much as 28 MTHM of aluminum-clad SNF from foreign research reactors (FRR) (18 MTHM), and domestic research reactors (DRR) (10 MTHM) to be shipped to SRS through 2035; and
- 20 MTHM of stainless steel or zirconium-clad SNF and some Americium/Curium Targets stored at SRS.

The EIS describes six categories of SNF based on fuel size, physical or chemical properties, and radionuclide inventories. These categories are described in the following table.

Spent Nuclear Fuel Groups

Fuel Group	Volume (MTRE)[a]	Mass (MTHM)[b]
A. Uranium and Thorium Metal Fuels	610	19
B. Material Test Reactor-Like Fuels	30,800	20
C. HEU/LEU[c] Oxides and Silicides Requiring Resizing or Special Packaging	470[d]	8
D. Loose Uranium Oxide in Cans	NA	0.7
E. Higher Actinide Targets	NA	<0.1
F. Non-Aluminum-Clad Fuels[e]	1,900	20.4
Total	**33,780**	**68.2**

NA = Not applicable

a. MTRE = Materials test reactor equivalent. An MTRE is a qualitative estimate of SNF volume that provides information on the amount of space needed for storage. An MTRE of Materials Test Reactor-Like Fuels would usually be one fuel assembly measuring about 3 inches by 3 inches by 2 feet long.

b. MTHM = Metric tons of heavy metal.
c. HEU = highly enriched uranium; LEU = low enriched uranium.
d. Fuel group also includes about 2,800 pins, pin bundles, and pin assemblies.
e. This fuel group will be shipped to INEEL. It will not be treated at SRS.

This EIS is directly related to decisions made in (and is therefore tiered off of) two other larger strategic and programmatic EISs impacting the larger DOE complex. They are discussed below.

Final Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Environmental Impact Statement; DOE/EIS-0203-F; April 1995.

DOE prepared this EIS (DOE 1995b) in compliance with a Court Order dated December 22, 1993, in the case of Public Service Company of Colorado v. Andrus, No. 91-0054-5-HLR (D. Idaho).

In the Record of Decision (60 FR 28680), DOE decided to manage its SNF by type (fuel cladding and matrix material) at the Hanford Site, the INEEL, and the SRS. Section C.1.2 in Appendix C of the SRS SNF Management EIS discusses its relationship to the programmatic SNF EIS. The amendment to the Record of Decision (61 FR 9441) has no impact on SRS.

Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel; DOE/EIS-0218F; February 1996.

This EIS (DOE 1996a) analyzes the management of FRR SNF that contains uranium originally produced or enriched in the United States (US). It also analyzes appropriate ways to manage such fuel received in the US, amounts of fuel, shippers, periods of time over which DOE would manage the fuel, modes of transportation, and ownership of the fuel.

In its Record of Decision (61 FR 25091), DOE determined it would accept from 41 listed countries aluminum-based SNF, Training Research Isotope General Atomic (TRIGA) SNF, and target material containing uranium enriched in the US. After a limited period of storage, DOE will process and package the SNF as necessary at the SRS and the INEEL to prepare it for disposal in a geologic repository. Section C.1.2 in Appendix C explains the relationship of the FRR SNF EIS to this EIS.

2. Alternatives Analyzed

The EIS was unable to analyze clear and distinct alternatives due to the complexity and number of considerations - mainly the number of SNF types vs. the treatment technologies.

<u>No Action Alternative</u>. The no action alternative consists of consolidation and collection of newly received shipments for storage in existing wet basins. In this option, the DOE would fail in its commitment to manage its SNF at the SRS in a road-ready condition for shipment to the repository or to the INEEL as required in the two overarching EISs from which this one is tiered.

To implement the proposed action, DOE analyzed impacts in five major areas of consideration: 1) the ultimate SNF repository, 2) SRS facilities, 3) new packaging technologies, 4) new processing technologies, and 5) conventional processing technologies.

Preferred Alternative. Under the preferred alternative, DOE would implement several of the technologies analyzed to manage SNF at SRS. These technologies are: 1) Melt and Dilute, 2) Conventional Processing, and 3) Repackage and Prepare to Ship to Other DOE Sites. Each of these technologies would treat specific groups of spent nuclear fuel.

For the Melt and Dilute technology, DOE would construct a treatment facility within an existing structure - building 105-L at the SRS, and build a new dry storage facility in the near by L Area for the product.

The Conventional Processing technology option would take place in the existing Fluorinel Cell Maintenance and Load Area (FH) Canyons.

For the Repackage and Prepare to Ship to Other DOE Sites technology option, only SNF bound for the INEEL is likely impacted. No new facility would be built for this purpose. This SNF would be prepared and packaged into a transportation cask at its current storage location and then shipped to the INEEL. Other SNF considered under this option (Higher Actinide Targets) would continue to be stored in their current locations until final disposition is determined.

3. Decisions to be Made

DOE will make decisions in the four following areas regarding the management and preparation of SNF for storage and ultimate disposition:

The selection of the appropriate treatment or packaging technologies to prepare aluminum-based SNF that is to be managed at SRS.

Whether DOE should construct new facilities or use existing facilities to store and treat or package aluminum-based SNF that is expected to be managed at SRS.

Whether DOE should repackage and dry-store stainless steel and zirconium-clad SNF pending shipment to the Idaho National Engineering and Environmental Laboratory.

Whether DOE should repackage and dry store Mark-51s and other americium/curium targets in the event dry storage capability becomes available at SRS.

4. INEEL Programs Analyzed

DOE proposes actions in five areas of management for the subject SNF. DOE proposes to:

A. Safely manage SNF that is currently located or expected to be received at SRS, including treating or packaging aluminum-based SNF for possible offsite shipment and disposal in a geologic repository and packaging non-aluminum clad fuel for on-site dry storage or offsite shipment.

B. Select a new non-chemical processing technology that would put aluminum-based FRR SNF into a form or container suitable for direct placement in a geologic repository. Treatment or conditioning of the fuel would address potential repository acceptance criteria and potential safety concerns. Implementing the new non-chemical processing treatment or packaging technology would allow DOE to manage the SNF in a road-ready condition at SRS in dry storage pending shipment offsite.

C. Manage the other aluminum-alloy SNF that is the subject of this EIS (DRR and DOE reactor fuels) in the same manner as the FRR SNF.

D. Use H Canyon to chemically separate highly enriched uranium-spent fuel.

E. Use conventional processing to stabilize some materials before a new treatment facility is in place. The rationale for this is to avoid the possibility of urgent future actions, including expensive recovery actions that would entail unnecessary radiation exposure to workers, and in one case, to manage a unique waste form (i.e., core filter block).

5. Decisions Regarding INEEL Programs

On August 7, 2000, DOE released its Record of Decision for the Savannah River Site Spent Nuclear Fuel Management Final Environmental Impact Statement.

The decision reads, in part:

…DOE has decided to implement the Preferred Alternative identified in the EIS. As part of the Preferred Alternative, DOE will develop and demonstrate the Melt and Dilute technology to manage about 97 percent by volume and 60 percent by mass of the aluminum-based SNF considered in the EIS (48 metric tons of heavy metal (MTHM) aluminum-based SNF).

Following development and demonstration of the technology (including characterization and qualification of the Melt and Dilute product to meet anticipated repository acceptance criteria), DOE will begin detailed design, construction, testing, and startup of a Treatment and Storage Facility (TSF). The SNF will remain in existing wet storage until treated and placed in dry storage in the TSF. The TSF will combine the transfer and treatment (Melt and Dilute) functions, to be constructed in the existing 105–L building, with a new dry storage facility to be constructed in L Area near the 105–L building.

DOE also has decided to use Conventional Processing (i.e., the existing canyons) to stabilize about 3 percent by volume and 40 percent by mass of the aluminum-based SNF. If the TSF becomes available before these materials have been stabilized, DOE may use the Melt and Dilute technology rather than Conventional Processing for their stabilization. DOE has also decided to continue to store small quantities of higher actinide materials until DOE determines their final disposition.

In addition, DOE will ship approximately 20 MTHM of non-aluminum-based SNF from the SRS to the Idaho National Engineering and Environmental Laboratory (INEEL). If DOE identifies any imminent health and safety concerns involving any aluminum-based SNF before the TSF becomes available, DOE will use Conventional Processing to stabilize the material of concern.

Of the 28 MTHM of aluminum-clad SNF from FRRs and Domestic Research Reactors to be received by the SRS through 2035, some 5 MTHM will be received from the INEEL. In addition, the SRS will ship some 20 MTHM of non-aluminum-based SNF to the INEEL.

DOE/EIS-0283 - Surplus Plutonium Disposition Final Environmental Impact Statement, November 1999

1. General Scope/Purpose and Need of EIS/EA

This EIS provides an assessment of the potential environmental impacts of dispositioning up to 50 metric tons of surplus, weapons-grade plutonium which are stored at seven DOE sites. One of the seven storage sites is the INEEL. The dispositioning would be accomplished either through immobilization or through use in mixed oxide (MOX) fuels.

"The purpose and need of this proposed action is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in a timely, and environmentally safe, manner."

2. Alternatives Analyzed

A total of 16 alternatives, including the No Action Alternative, were analyzed for implementation at one or more of five candidate DOE sites (i. e., Hanford, SRS, INEEL, Pantex, and ORNL). In two of the 16 alternatives:

(A) The ANL-W facility at the INEEL was a candidate location for the MOX fuel fabrication facility.

(B) The INEEL was a candidate location for the Pit Disassembly and Conversion facility.

No Action Alternative. Surplus weapons-grade plutonium is stored safely rather than immobilized or used in MOX fuel.

Pit Disassembly and Conversion Alternatives. Fifteen (15) alternatives at five DOE sites were evaluated.

Plutonium Conversion and Immobilization Alternatives. Fifteen (15) alternatives at two DOE sites were evaluated.

MOX Fuel Fabrication Alternatives. Eleven (11) alternatives at four DOE sites were evaluated.

3. Decisions to be Made

The decisions to be made by the DOE in this EIS are:

(A) Whether to construct and operate pit conversion facilities and, if so, where;

(B) Whether to construct and operate immobilization facilities and, if so, where; and

(C) Whether to construct and operate MOX fuel fabrication facilities and, if so, where.

4. INEEL Programs Analyzed

The program analyzed was construction and operation of a MOX fuel fabrication facility at ANL-W.

5. Decisions Regarding INEEL Programs

The INEEL was not a preferred location for any activity. The preferred locations for the facilities were:

(A) SRS for pit conversion, immobilization and MOX facilities. "SRS is preferred for the MOX facility because this activity complements existing missions and takes advantage of existing support infrastructure and staff expertise."

(B) LANL for lead assembly activities

(C) ORNL for post-irradiation examination activities

DOE/EIS-0287D - Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement, December 1999

1. General Scope/Purpose and Need of the EA/EIS

The Draft EIS analyzes the potential environmental consequences of managing two waste types at the INEEL, high-level waste in a calcine form and liquid mixed transuranic waste (historically known as sodium bearing waste and newly generated liquid waste). It also analyzes the disposition of existing and proposed high-level waste facilities at INTEC after their missions have been completed. From the purpose given on Page S4, Section 1.2-To resolve waste management issues DOE needs to decide: How to treat INTEC mixed HLW so that it can be transported out of Idaho to a storage facility or repository; How to treat and where to dispose of other radioactive wastes that are associated with the HLW management program at INTEC; How to manage treated INTEC wastes that are ready to be transported out of Idaho; How to close HLW-related facilities at INTEC, including certain liquid waste storage tanks, bin sets, the New Waste Calcining Facility, and facilities that would be constructed under the waste processing alternatives and treatment options, and associated laboratories and support facilities.

2. Alternatives Analyzed

No Action. The New Waste Calcining Facility (NWCF) calciner would be placed in standby in June 2000. The calciner would not be upgraded and no liquid TRU/Sodium Bonded Waste (SBW) would be calcined after that date. The NWCF calciner and bin sets would remain in standby indefinitely. The High Level Liquid Waste Evaporator would continue to operate to reduce liquid mixed TRU volume to enable DOE to cease use of the 5 pillar and panel tanks by 2003. Maintenance necessary to protect workers and the environment would continue but there would be no upgrades.

Continued Current Operations. The NWCF calciner would be placed in standby after June 2000 and upgrades for RCRA permitting would be completed by 2010. The calciner would operate from 2011 to 2014 to calcine remaining liquid TRU/SBW. Tank Farm heels and newly generated liquid waste would pass through an ion exchange column. LLW would be grouted and disposed of on the INEEL and TRU waste would be disposed of at WIPP. The calcine would be stored in the bin sets indefinitely.

Separations Option. The Separations Alternative comprises 3 options, each of which uses a chemical separation processes, such as solvent extraction. Because HLW would be separated into fractions, DOE would need to determine, before undertaking the separation process, whether any of the fractions are waste incidental to reprocessing that would be more appropriately managed as TRU or LLW rather than HLW.

Full Separations Option. This option would separate the most highly radioactive and long-lived radioactive isotopes from the calcine and liquid mixed TRU/SBW.

Planning Basis Option. This option reflects previously announced DOE decisions and agreements with the State of Idaho. It is similar to the Full Separations Option except that, prior to separation, the liquid mixed TRU would be calcined and stored in the bin sets along with the HLW. Under this option the calciner would be placed in standby and upgraded to meet RCRA requirements. Calcine would be retrieved, dissolved, and separated as with the Full Separations option.

Transuranic Separations Option. There would be no HLW after treatment under this option. DOE would retrieve and dissolve the calcine and liquid TRU/SBW. The wastes would be separated into TRU and LLW fractions.

Non-Separations Alternative. This Alternative would process the calcine and liquid TRU/SBW into an immobilized form by a target date of 2035 for subsequent shipment to a repository. There are three treatment options under this alternative.

Hot Isostatic Pressed Waste Option. All liquid TRU waste would be calcined and all calcine would be converted to an impervious, no-leaching, glass ceramic waste form.

Direct Cement Waste Option. All liquid TRU waste would be calcined and all calcine would be converted to a cement-like solid.

Early Vitrification Option. Both liquid TRU waste and calcine would be vitrified into a non-leaching, glass like solid. DOE would construct a vitrification facility.

Minimum INEEL Processing Alternative. The calcine would be retrieved and packaged and placed into shipping containers. The containers would be shipped to Hanford where the calcine would be dissolved and separated into high activity and low activity fractions. The fractions would be vitrified. The vitrified waste would be returned to Idaho or sent directly to a geologic repository.

Facility Disposition Alternatives. INTEC facilities involved in the treatment or management of HLW would be left standing or closed under several alternatives.

No Action. The facilities would not be dismantled and disposed of, they would be placed in an industrially safe condition and surveillance and maintenance would continue until 2095.

Clean Closure Alternative. Facilities would be removed and disposed of; the site would be decontaminated until it was indistinguishable from background.

Performance-Based Closure. Closure methods would be determined on a case-by-case basis depending on risk.

Closure to Landfill Standards. Facilities would be closed in accordance with State of Idaho and Federal requirements specified for closure of landfills.

Performance-Based Closure with Class A Grout Disposal. The Tank Farm and Bin Sets would be used for the disposal of Class A LLW in a grout form and closed under performance-based standards. The class A LLW would be produced under the Full Separations Option.

Performance-Based Closure with Class C Grout Disposal. The Tank Farm and Bin Sets would be used for the disposal of Class C LLW in a grout form and closed under performance-based standards. The class C LLW would be produced under the TRU Separations Option.

3. Decisions to be Made

The EIS will be the basis for negotiations under the Idaho Settlement Agreement. It is expected that the following decisions will be made:

- How to treat INTEC mixed HLW (calcine) and liquid TRU/SBW waste so that it can be transported out of Idaho to a storage facility or repository.
- How to treat and where to dispose of other radioactive wastes associated with the HLW management program at INTEC.
- How to manage treated INTEC wastes that are ready to be transported out of Idaho.
- How to close HLW-related facilities at INTEC, including liquid waste storage tanks and bin sets.

4. INEEL Programs Analyzed

This EIS analyzes and makes long-term decisions for the INEEL HLW program.

5. Decisions Regarding INEEL Programs

The Record of Decision is expected in late spring or early summer of 2001.

DOE/EIS-0290 - Advanced Mixed Waste Treatment Project Final Environmental Impact Statement, January 1999

1. General Scope/Purpose and Need of the EA/EIS

The EIS addresses 65,000 cubic meters of transuranic waste, alpha-contaminated low-level mixed waste, and low-level mixed waste at the Radioactive Waste Management Complex on the INEEL. Approximately 95% of this waste is classified as mixed waste because it contains hazardous waste regulated under RCRA. Some of the wastes also contain polychlorinated biphenyls (PCBs), which are regulated under TSCA. The wastes are all intermingled in common containers. DOE needs to place these wastes in a configuration that will allow for their disposal at WIPP or other appropriate facility in compliance with state and federal law and consistent with the schedule contained in the Idaho Settlement Agreement. DOE anticipates that it may treat up to an additional 120,000 cubic meters of TRU waste, alpha MLLW, and MLLW as bounded by the EIS. These wastes are currently located, or may be generated, at other areas on the INEEL and at other DOE sites. Transfers of TRU waste from other sites would require revision of the TRU ROD on the Final Waste Management Programmatic EIS and be subject to agreements between DOE and states relating to the treatment and storage of TRU waste.

2. Alternatives Analyzed

<u>Action</u>. Ongoing TRU waste, Alpha MLLW, and MLLW management operations and projects would continue and existing facilities would remain in use. The management and operations (M&O) contractor (rather than British Nuclear Fuels, Limited (BNFL)) would continue preparation to ship 3100 cubic meters of TRU waste to WIPP using existing facilities. Shipments to WIPP would occur that could be supported by existing facilities at the INEEL.

<u>Proposed Action/Preferred Alternative</u>. The M&O contractor would continue preparation to ship 3,100 cubic meters of TRU waste to WIPP using existing facilities. The construction and operation phases of the AMWTP would be implemented in accordance with the existing contract with BNFL.

<u>Non-thermal Treatment Alternative</u>. The M&O contractor would continue preparation to ship 3.100 cubic meters of TRU waste to WIPP using existing facilities. The AMWTP facility would be constructed but without incineration or microencapsulation process. Supercompaction and macroencapsulation would be used to treat the wastes. Wastes that require thermal treatment to meet disposal criteria would be repackaged and re-stored until a treatment option is identified and evaluated under NEPA.

<u>Treatment and Storage Alternative</u>. The M&O contractor would continue preparation to ship 3.100 cubic meters of TRU waste to WIPP using existing facilities. The AMWTP facility would be built in the same location, contain the same treatment processes, and produce the same final waste forms as the preferred alternative. The difference between this alternative and the Preferred Alternative is that the treated waste would not be shipped to an off-site disposal facility but would be placed in RCRA-permitted storage units at the RWMC.

<u>Alternatives Considered but Not Analyzed</u>. DOE also considered but did not analyze treatment of wastes at existing offsite treatment facilities, siting of the AMWTP at other locations on the

INEEL, Treatment using other non-thermal treatment processes and treatment using other thermal treatment processes.

3. Decisions to be Made

Decisions to be made are whether to proceed with the proposed construction and operation of a TRU treatment facility to potentially include LLW and MLLW treatment.

A procurement contract for treatment services was awarded to BNFL Inc. on December 20, 1996. Construction and operation of the treatment facility was contingent upon DOE's completion of an EIS and issuance of a record of decision. If DOE decided not to move forward with construction and operation of the facility, the contract would have been terminated.

4. INEEL Programs Analyzed

Construction and operation of a new TRU treatment facility at the RWMC.

The EIS and ROD affect Waste Management Programs under the Assistant Manager for Environmental Management and operations at the Radioactive Waste Management Complex. AMWTP operations will eventually probably replace WERF operations.

5. Decisions Regarding INEEL Programs

The decision in the ROD (March 1999) was to implement the preferred alternative to proceed with the construction and operation of the AMWTP in accordance with the contract with BNFL.

DOE/EIS – 0306 - Final Environmental Impact Statement for the Treatment and Management of Sodium-bonded Spent Nuclear Fuel, July 2000

1. General Scope/Purpose and Need of EIS/EA

This Environmental Impact Statement (EIS), prepared by DOE's Office of Nuclear Energy (NE), responds to the need for DOE to safely and effectively manage a certain surplus material, DOE-owned sodium-bonded spent nuclear fuel (SBSNF), and facilitate its eventual interment in a geologic repository. Management of this material is complicated by the fact that metallic sodium is reactive and the assumption that the repository will not accept a waste package containing untreated sodium metal.

The EIS evaluated treatment and management options for four categories of DOE-owned SBSNF totaling some 60 MTHM. The categories are: 1) Experimental Breeder Reactor (EBR)-II driver and blanket assemblies; 2) Fast Flux Test Facility (FFTF) elements and assemblies; 3) miscellaneous SNF from liquid metal reactor experiments; and 4) Fermi-1 Blanket assemblies.

The fuels addressed within the EIS concern some 60 metric tons of heavy metal (MTHM) of sodium bonded SNF associated with the research and development of liquid metal fast breeder reactors. These fuels are of two types--driver and blanket fuels. Driver fuel contains highly enriched fissile isotope uranium-235, and is placed at the center of the reactor core to drive the reaction. Blanket fuel contains the non-fissile isotope uranium-238 and is placed at the perimeter of the core to breed plutonium-239.

These fuels contain metallic sodium between the cladding and the metallic fuel pins to promote heat transfer from the fuel to the reactor coolant. Not all driver assemblies contain sodium. However, all of the blanket assemblies considered here do contain sodium.

The EIS evaluated the potential direct, indirect, and cumulative environmental impacts associated with the treatment of SBSNF in one or more SNF management facilities. In addition, the EIS evaluated the environmental impacts of the No Action Alternative.

The EIS analyzed the potential environmental impacts associated with the proposed actions, which includes:

1) preparation prior to treatment;
2) treatment and management;
3) transportation; and
4) decontamination and deactivation of the equipment used for treatment.

Impacts from the transport to INEEL of SBSNF from DOE sites such as the Hanford Site in Washington, Sandia National Laboratories in New Mexico, and Oak Ridge National Laboratory in Tennessee are considered adequately addressed in the INEL SNF EIS.

2. Alternatives Analyzed

DOE has proposed to treat and manage SBSNF at one or more of the following SNF management facilities: ANL-W at the INEEL, and the F-Canyon or Building 105-L at SRS. The impacts from the treatment and management of SBSNF at INEEL and SRS and their SNF management facilities are described. In addition to the No Action Alternative, the EIS analyzed six alternatives under the proposed action that employ one or more of the following technology options: electrometallurgical treatment (EMT), the plutonium-uranium extraction (PUREX) Process, packaging in high-integrity cans, and the melt and dilute process. The use of EMT at a site other than ANL-W, the GMODS process, the direct plasma arc-vitreous ceramic treatment, and the chloride volatility process were considered and deemed not to be reasonable alternatives under the proposed action, and were, therefore, dropped from further consideration.

The EIS proposed and analyzed seven alternatives:

1) No action. The no action option includes: 1) continued storage at current locations; and 2) packaging in high-integrity cans without treatment for direct disposal into the repository;
2) Electrometallurgically treat blanket and driver fuel at ANL-W;
3) Clean and package blanket fuel in high-integrity cans and electrometallurgically treat driver fuel at ANL-W;
4) Declad and clean blanket fuel and electrometallurgically treat driver fuel at ANL-W, and PUREX process blanket fuel at SRS;
5) Melt and dilute blanket fuel and electrometallurgically treat driver fuel at ANL-W;
6) Declad and clean blanket fuel and electrometallurgically treat driver fuel at ANL-W, and melt and dilute blanket fuel at SRS; and
7) Melt and dilute blanket and driver fuel at ANL-W.

3. Decisions to be Made

As presented within the EIS, based on the analytical results, as well as cost, schedule, and nonproliferation considerations, DOE will make the following decisions:

1) Whether to use an existing, mature technology to treat the SBSNF, and if so, which technology should be selected and where should it be implemented; and
2) Whether to take no action now and wait for further information regarding the potential development of a geologic repository, or promote the development of a less mature (e.g., glass material oxidation and dissolution system, plasma arc) or new treatment technology.

In summary, DOE must select a treatment technology or management strategy for SBSNF, and the location for the treatment or management of SBSNF to facilitate disposal in a geologic repository.

4. INEEL Programs Analyzed

This EIS analyzed the use of seven different technologies:

1) an electrometallurgical treatment (EMT) process;
2) the PUREX process;
3) placement of SNF in high-integrity cans;
4) a melt and dilute process;
5) a glass material oxidation and dissolution system process;
6) a direct plasma arc-vitreous ceramic process; and
7) chloride volatility process.

This EIS analyzed use of these technologies at three facilities located at two DOE sites:

1) The Idaho National Engineering and Environmental Laboratory, ANL-W facilities; and
2) The Savanna River Site
   - The F-Canyon
   - Building 105-L.

5. Decisions Regarding INEEL Programs

In the final EIS, DOE announces its preferred alternative to be electrometallurgical treatment of SBSNF at ANL-W except for Fermi-1 blanket SNF. A decision on Fermi-1 blanket SNF will be deferred until a later time. A record of decision has not been issued at this time.

Under the preferred option, the Office of Nuclear Energy (NE) has proposed to treat the first three categories of SNF described totaling some 26 MTHM.

The Office of Environmental Management (EM) is responsible for developing an evaluation of alternative management methodologies for the 34 MTHM of Fermi-1 blanket sodium-bonded SNF. EM has charged the DOE Operations Office at the INEEL (DOE-ID) with this task.

DOE/EIS-0310D - Draft Programmatic Environmental Impact Statement for Accomplishing Expanded Civilian Nuclear Energy Research and Development and Isotope Production Missions in the United States, Including the Role of the Fast Flux Test Facility, July 2000

1. General Scope/Purpose and Need of the EIS/EA

DOE proposes to enhance its existing nuclear facility infrastructure to provide for: 1) production of isotopes for medical, research and industrial uses, 2) production of plutonium-238 (Pu-238) for use in advanced radioactive isotope power systems for future NASA space exploration missions, and 3) the nation's nuclear research and development needs for civilian applications.

Isotope Production – Production of medical and industrial isotopes involves 1) fabricating specially designed targets at a target fabrication facility, 2) irradiating the targets in an irradiation facility to generate specific medical isotopes, and 3) processing the targets at a target fabrication facility to prepare the medical isotopes for shipment to customers.

Pu-238 Production – Production of Pu-238 involves the fabrication of Np-237 targets, irradiating the targets in an irradiation facility, and processing the targets to prepare the Pu-238 product for shipment to Los Alamos National Laboratory where it would be fabricated into heat sources for radioisotope power systems.

Nuclear Research and Development – Nuclear research and development initiatives requiring an enhanced DOE facility infrastructure fall into three basic categories: materials research, nuclear fuel research, and advanced reactor development.

2. Alternatives Analyzed

No Action Alternatives. Under the No Action alternative, FFTF would be maintained in standby status for the 35 years covered in this NI PEIS. Ongoing operations at existing operating facilities would continue. DOE would not establish a domestic Pu-238 production source. Transportation of Pu-238 from Russia and throughout the U. S. is analyzed with various storage and transportation options. Three facilities are analyzed for storage and processing options.

Alternative 1 – Restart FFTF. The FFTF at Hanford would be restarted and operated for 35 years. FFTF would be used to irradiate targets for medical and industrial isotope production, Pu-238 production, and nuclear research and development irradiation requirements. Ongoing operations at existing operating facilities would continue. Three facilities were analyzed for target preparation and post-irradiation processing.

Alternative 2 – Use Only Existing Operational Facilities. DOE would use existing operating DOE reactors or U. S. commercial nuclear power plants to produce Pu-238 for future space missions as well as to continue to produce medical and industrial isotopes and support nuclear research and development in DOE reactors and accelerators.

Alternative 3 – Construct New Accelerators. One or two new accelerators would be used for target irradiation for a period of 35 years. The new accelerators, to be constructed at an existing or new DOE site, would be used to irradiate all of the targets. Ongoing operations at existing operating facilities would continue.

Alternative 4 – Construct New Research Reactor. A new research reactor would be used for target irradiation for a period of 35 years. The new research reactor, to be constructed at an existing or new DOE site, would be used to irradiate all targets. Ongoing operations at existing facilities would continue.

Alternative 5 – Permanently Deactivate FFTF. FFTF at Hanford would be permanently deactivated without making enhancements to DOE's nuclear facilities infrastructure. Ongoing operations at existing operating facilities would continue.

3. Decisions to be Made

DOE must decide whether to enhance current U.S. nuclear infrastructure to meet projected requirements for future medical and industrial isotope production, nuclear research and development, and/or plutonium-238 production.

DOE must select the facilities to support its proposed missions if a decision is made to enhance U.S. nuclear infrastructure.

DOE must determine whether to restart FFTF as part of a nuclear infrastructure enhancement program and, if not, whether to remove FFTF from standby condition and permanently deactivate it in preparation for its eventual decontamination and decommissioning.

DOE must decide whether to continue purchasing pluonium-238 from Russia to support future NASA space missions if U.S. nuclear infrastructure is not enhanced.

DOE must determine whether its inventories of neptunium-237 should be relocated for continued storage or processed for disposal as waste.

4. INEEL Programs Analyzed

The programs that are analyzed in this PEIS are the Advanced Test Reactor with support facilities and the Fluorinel Dissolution Process Facility (FDPF) for 35 years. In Alternative 2 the ATR is considered in a number of options both singly and in combination with the High Flux Isotope Reactor. The FDPF is considered as a storage and processing facility in the No Action alternative and Alternative 2.

Included is a description of base operations at the Test Reactor Area including operation of the Advanced Test Reactor, Advanced Test Reactor Critical facility, and the Nuclear Materials Inspection and Storage facility and other supporting facilities. This also includes an analysis of environmental impacts of base operations.

The FDPF analysis includes transportation from SRS and storage of Neptunium-237 and associated isotopes for 35 years. Fabrication and processing Np-237 targets associated with Pu-238 production is also included.

5. Decisions Regarding INEEL Programs

The Final PEIS is not yet completed. The ROD is projected to be completed in December 2000.

DOE/ID-10636 - Supplement Analysis for a Container System for the Management of DOE Spent Nuclear Fuel Located at the INEEL, March 1999

1. General Scope/Purpose and Need of EIS/EA

The Supplement Analysis (SA) responds to the Settlement Agreement (U.S. District Court 1995) signed by the State of Idaho, the U.S. Department of the Navy, and the U.S. Department of Energy (DOE) in October 1995. The SA states in Section F.4, "DOE and the Navy shall employ Multi-Purpose Canisters ("MPCs") or comparable systems to prepare spent fuel located at INEL for shipment and ultimate disposal of such fuel outside Idaho." The SA further requires that a Record of Decision (ROD) for appropriate National Environmental Policy Act (NEPA) analysis be completed by April 30, 1999.

This SA analyzes two separate, but applicable EIS documents. They are:

Programmatic Spent Nuclear Fuel (SNF) Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement (EIS), DOE/EIS-0203-F, U.S. Department of Energy, Washington, DC, April 1995; (1995 EIS) and

Final Environmental Impact Statement for a Container System for the Management of Naval Spent Nuclear Fuel, DOE/EIS-0251, U.S. Department of the Navy, November 1996 (Navy Container System EIS).

The Proposed Action evaluated in this Supplement Analysis considers the use of a dual-purpose canister system, or comparable multi-purpose canister system, for the storage and ultimate shipment of DOE-ID spent nuclear fuel out of the State of Idaho.

The evaluation of the Proposed Action considers the potential environmental impacts for: (a) the manufacturing of canister systems, (b) loading and storage of spent nuclear fuel at the Idaho National Engineering and Environmental Laboratory (INEEL), (c) transportation of DOE-ID spent nuclear fuel for ultimate disposition outside Idaho, and (d) cumulative impacts. Impacts of the Proposed Action were compared to impacts previously evaluated in the SNF & INEL EIS and the Navy Container System EIS.

2. Alternatives Analyzed

Because this is a Supplement Analysis, no alternatives were analyzed.

3. Decisions to be Made

DOE must decide whether:

- an existing EIS should be supplemented;
- a new EIS should be prepared; or
- no further NEPA documentation is required.

4. INEEL Programs Analyzed

The programs analyzed are described within the two EIS's listed above.

On June 1, 1995, DOE published a ROD (60 FR 28680) for the SNF & INEL EIS. In the ROD, the DOE and the U.S. Department of the Navy, as a cooperating agency, announced their decision regarding management of existing and reasonably foreseeable inventories of SNF through the year 2035.

In November 1996, the Department of the Navy published the Navy Container System EIS. In the first ROD resulting from this EIS published in January 1997, (62 FR 1095) the Navy and the DOE, as a cooperating agency, announced their decision regarding selection of a dual-purpose canister system for the loading, storage, transport, and possible disposal of naval SNF. These actions, in addition to the issuance of a second ROD regarding location of loading and dry storage facilities for naval SNF, completed the Navy's action required under Section F.4 of the Settlement Agreement.

The Navy Container System EIS and its resulting RODs addressed only naval SNF located at the INEEL. To complete all actions required under Section F.4 of the Settlement Agreement, further National Environmental Policy Act (NEPA) evaluation was required to address the non-Navy DOE SNF located at the INEEL. DOE has prepared this SA to determine what further NEPA review may be required in fulfillment of its responsibilities under Section F.4 of the Settlement Agreement.

5. Decisions Regarding INEEL Programs

On March 4, 1999, the Idaho Manager signed and issued the *Department of Energy, Idaho Operations Office (DOE-ID) Determination and Record of Decision on National Environmental Policy Act (NEPA) Analysis*. The determination and decision are as follows.

DETERMINATION AND DECISION: Based on the Supplement Analysis and in accordance with my authority under Section 5.a. (11) of DOE Order 451.1A, I (the Manager) have determined that the environmental impacts of DOE-ID's use of multiple purpose canisters or comparable system as described herein has been adequately analyzed in the SNF & INEL EIS and Navy Container System EIS. No further NEPA documentation is required and neither a supplemental EIS, nor a new EIS need to be prepared. This determination and decision constitutes final agency action by DOE-ID to procure and use dual purpose or multi purpose canisters or comparable systems for the storage and transport of INEEL spent nuclear fuel. This determination and decision does not preclude issuing another Record of Decision for the SNF & INEL EIS if it becomes necessary to do so. Also, this decision does not commit DOE to a single course of action or the use of a particular spent nuclear fuel container system if improvements in design are made in the future and are selected pursuant to future NEPA review and coordination with the State of Idaho. Finally, this determination and decision does not in any way select or predispose a means of transportation of the SNF, whether road or rail, nor does it select a transportation route or destination.

On May 4, 1999, DOE released its *Record of Decision for a Multi-purpose Canister or Comparable System for Idaho National Engineering and Environmental Laboratory Spent Nuclear Fuel* (64 FR 23825). The decision is as follows.

DECISION: DOE has decided to use a multi-purpose canister or comparable system (e.g., dual-purpose canister system or other system as described and analyzed in the context of the Container System EIS) for the management of DOE-owned spent nuclear fuel at the INEEL, based on cost, operational efficiency, regulatory acceptance, and environmental and public health considerations. Except for those fuels that may be processed (e.g., sodium bonded fuel) and a small fraction of spent nuclear fuel (10% or less) that may be suitable for shipment using existing transportation casks, a multi-purpose canister system (or comparable system) will be used for the loading and storage of DOE-owned spent nuclear fuel at the INEEL and for transportation of this spent nuclear fuel for ultimate disposition outside the State of Idaho. This decision does not commit DOE to a single course of action or the use of a particular spent nuclear fuel container system if improvements in design are made in the future and are selected pursuant to future NEPA review and coordination with the State of Idaho.

OPE-TRA-00-002 - Baseline Document for the Test Reactor Area Hot Cells (TRAHC), January 2000

1. General Scope/Purpose and Need of EIS/EA

The TRAHC were in operation prior to the effective date of the National Environmental Policy Act statue, January 1, 1970. As a result, NEPA documentation was never prepared for TRAHC facility construction or operations. This has created difficulties for the ID NEPA Compliance Officer (NCO) and the INEEL NEPA Planning Board in determining what constitutes ongoing operations and what constitutes new activity requiring NEPA review. This document establishes an environmental Baseline Document for the TRAHC for NEPA purposes. This document will be used by the NCO as the baseline against which any future proposed activity is measured to determine requirements for NEPA review.

2. Alternatives Analyzed

Due to the nature of the Baseline Document, no alternatives were considered.

3. Decisions to be Made

No decisions were made as a result of the preparation of this document.

4. INEEL Programs Analyzed

TRA Hot Cell operations were analyzed to define historical operations, operating parameters, operational incidents, waste stream generation, air effluents, and worker radiological exposure.

5. Decisions Regarding INEEL Programs

No decisions were made based on the approval of this document.

NUREG-1626 - Final Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Installation to Store the Three Mile Island Unit 2 Spent Fuel at the Idaho National Engineering and Environmental Laboratory, Docket No. 72-20, March 1998

1. General Scope/ Purpose and Need of EA/EIS

The Final Environmental Impact Statement was prepared by the Nuclear Regulatory Commission (NRC), Office of Nuclear material Safety and Safeguards to assess the potential environmental impacts of licensing the construction and operation of an independent spent fuel storage installation (ISFSI) for the dry storage of the fuel debris from the Three Miles Island Unit 2 (TMI-2) reactor. The ISFSI is to be located at the then Idaho Chemical Processing Plant (ICPP), now known as the Idaho Nuclear Technology Engineering Center (INTEC) at the Idaho National Engineering and Environmental Laboratory (INEEL).

As part of its overall spent nuclear fuel (SNF) management program, the U.S. Department of Energy (DOE) has prepared a final programmatic EIS that provides an overview of the SNF management strategy proposed for the INEEL, including the construction and operation of the TMI-2 ISFSI. In addition, the DOE Operations Office (DOE-ID) has prepared an environmental assessment (EA) to describe the environmental impacts associated with the stabilization of the TAN storage pool and the construction/operation of the ISFSI at INTEC.

The NRC has determined that its proposed action is substantially the same as actions considered in DOE's environmental documents, and therefore as permitted under 10 CFR Part 51, has elected to adopt the DOE documents as the NRC FEIS.

The NRC's proposed action is to issue a license authorizing DOE-ID to construct and operate a dry storage ISFSI at INTEC. The proposed action considered in the DOE-ID environmental documents is to remove the TMI-2 core debris from the TAN storage pool in preparation for transport and dry storage. Established storage cask technologies would be used for dry storage on a concrete base mat constructed at INTEC. The TMI-2 debris canisters would be stored in a dry shielded canister (DSC) and transported to INTEC for storage in an ISFSI. The ISFSI would be an aboveground storage system using horizontal storage modules (HSMs) that would be sited, constructed, and operated at INTEC.

DOE's need for the proposed action is to meet the terms and conditions of the Settlement Agreement reached among the DOE, the State of Idaho, and the U.S. Department of the Navy (US District Court Civil No. 91-0035-S-EJL and Civil No. 91-0054-S-EJL, dated October 17, 1995). Under the terms of this agreement, the DOE has committed to constructing the ISFSI by December 31, 1998 and beginning to move fuel into the facility by March 31, 1999. In addition to terms in the Settlement Agreement, vulnerabilities in SNF storage at the TAN storage pool need be addressed by remedial action or by emptying the pool of SNF and water.

2. Alternatives Analyzed

The alternatives analyzed within the DOE-ID environmental documents included no-action, storage methods, and storage location alternatives. They are discussed below.

1) No-Action

The no-action alternative is denial of the license application for the ISFSI resulting in continued storage of SNF in the TAN pool.

2) Storage Methods

The FEIS considers alternative SNF storage methods, including:

- Constructing a new wet storage pool;
- Refurbishing the existing TAN pool; and
- Constructing the ISFSI, as described, at INTEC.

3) Storage Locations

The FEIS considers alternative SNF storage locations, including:

- TAN;
- Birch Creek Area;
- Lemhi Range Area; and
- INTEC.

DOE-ID determined to build the described ISFSI using DSCs and HSMs at INTEC.

3. Decisions to be Made

The NRC's proposed action and decision is whether to issue a license authorizing DOE-ID to construct and operate a dry storage ISFSI at INTEC.

4. INEEL Programs Analyzed

The analyses required for the NRC to make its decision included the environmental impacts of:

- Construction; and
- Operation.

5. Decisions Regarding INEEL Programs

The NRC concluded that the TMI-2 ISFSI represented only a small part of overall SNF management activities at the INEEL. The NRC further concluded that the potential impacts of construction and operation of the ISFSI are small when considered within the context of the: 1) Settlement Agreement; 2) current vulnerabilities at the TAN pool; 3) current environmental conditions at the INEEL; and 4) ongoing operations at the INEEL. The NRC determined to support licensing of the ISFSI in the FEIS. The NRC issued the license on March 19, 1999 (SNM-2508).